Newark Shop Notebook, Cat. 1181

This set of forty-six unbound and numbered pages covers the period August 1871-January 1872. The entries, dated and signed by Edison, are in his hand and contain descriptions of the components of printing chemical telegraphs and perforators, supplemented by detailed ink drawings. The names of Samuel Edison and Joseph Murray appear as witnesses.

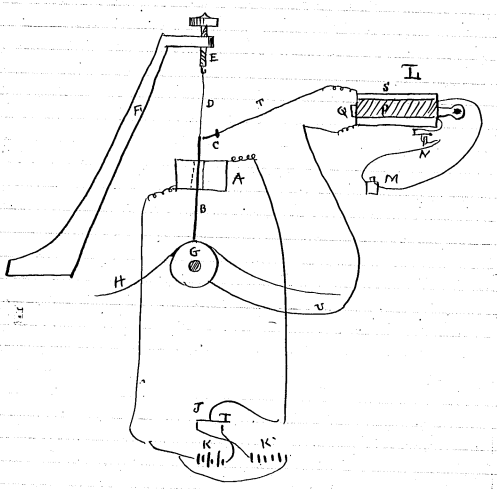
Blank pages not filmed: 18-31.

Newark N.J. Aug 5. 1871

Record of ideas conceived, and experiments tried on miscellaneous Machines and things, to which dates are appended, and such record to be used in any contest ~~regarding~~ or disputes regarding priority of ideas or invention,

T.A. Edison

Device for recording upon ~~chemical~~ upon chemically prepared paper by a "jump spark" or Current of electricity of high tension. Fig' 1 will give the principle of the device



This device I do not consider fast ~~enough~~ and not applicable to Automatic or fast Telegraphy, but that shown in another figure 2, is. —— The main result which I have endeavored to obtain in this device is producing or effecting a visible record by ~~an~~ use a very feeble Current. Sir Wm Thompson some time since invented what is known as the Syphon Ink Recording Galvanometer, which is used on the Atlantic Cable and is the first recording Apparatus which had no friction in its parts. In my device I am enabled to move the recording parts which much less Current than the Apparatus of Sir

Wm Thompson and also dispense with a large amount of apparatus which accompanies that apparatus.

In my recorder the pen B consists of an exceedingly fine steel needle of about 1½ inches in length and suspended within a helix A of very fine insulated wire, and held by a single fibre of silk to the adjusting screw E. the drawn end of the suspended needle B after passing through the helix A nearly touches the paper, chemically prepared, upon the drum G which is rotated by suitable Machinery. The helix A is connected to the line and battery K and Break Key J so that by opening & closing the Key alternate positive & negative Currents will be sent of the line and the needle B deflected back and forth over the paper but not touching it. With the exception of having the chemically prepared paper under the end of the needle, so far it is but a Common galvanometer,

C is a point adjusted quite closely to the needle B but not touching it. This point C is connected to the Secondary Coil of a powerful "Inductorium" by the wire T and the Drum G to the other end by the wire U so that when the Vibrator N and primary Coil is working powerful Currents of electricity will be generated of sufficient tension to jump from the point C to the needle B. thence jump through the wet paper to the drum & back to the Inductorium forming a complete circuit. this current in passing through the chemically prepared paper decomposes the substance with which it is saturated and leaving a mark of the paper is carried along Continuously by the drum G. And the needle B is at rest a Continuous ~~mark~~ mark will be left on the paper, the positive & negative Current passing with such inconceivable rapidity through the paper that the line is continuous. If now the needle is moved back and forth by equally the Key J a Zig Zag line will be given to the right by a positive and forming a dot and to the left by a negative and forming a dash — Fig 2

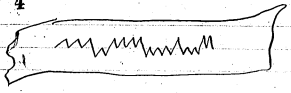
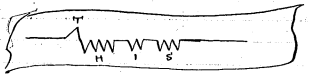


Fig 2

The word "this" would be recorded



Above drawn & written Aug 5 1871

Witness. Samuel Edison T A. Edison

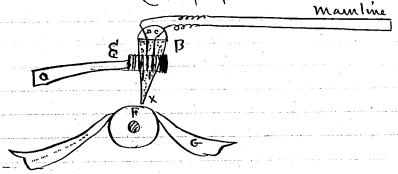
I will mention here that the inductorum can be dispensed with and a magneto electric machine used to generate the high tension current, I do not wish to confine myself to any particular device for making the high tension current, I make a zig zag motion right to left & left to right and recording the jump spark upon Chemically prepared paper as it can be done in innumerable ways many of which I could mention but which I consider quite unnecessary. What I will probably claim when I apply for a patent will be the General feature or principle underlying the Combination to produce the effect.

I will now explain a modification of this device for recording very rapid writing. In this Case – No I will not – I was mistaken –

An Idea strikes me that sulphuretted hydrogen or some other gas that will discolor certain chemical solutions Could be used in Chemical Telegraphs. Supposing a long strip of paper was prepared with a chemical Solution Which would be discolored by a certain gas, and a fine jet of this gas was let play upon the surface of the paper and the paper carried forward by clock work a Continuous mark or line would be made on the paper if the jet was controlled so that it could be

let off an on by an electro magnet placed in the main circuit, it would produce the same results, as the decomposition of the chemical solution by the electricity itself, and an advantage gained would be that the marks would not tail out and that the mark could be made large or small without regard to the strength of the current which worked the magnet.

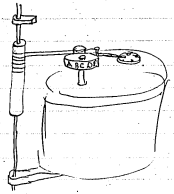
Ink recording Telegraph



F a paper carrying drum over it suspened and held by E is a air tight bulb B filled with ink into which is connected the main line wire D and C. at every closure of the current, gas is generated by the current passing through the ink and decomposing the Water contained in it, this gas expands & pushes the ink out at the End of the bulb B at X through a very fine aperture, and it falls on the paper, so that as long as the Current is closed gas is made which continues to force the ink out through the aperture X on the paper which passing along leaves a continuous Mark of the Current be now interrupted no More gas is generated and the ink ceases to come out of the aperture X —

8th August. T A Edison

Witness Jos T. Murray

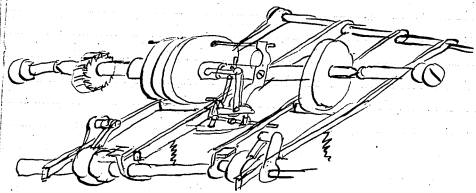


Dec 24 1871

Sliding pasted reel for pasting strips of a printing Telegraph machine on a mss form.

To prevent the saws composing a gang saw from running out of fine file or cut small teeth on the side of the main cutting teeth, so that when the saw runs out the strain will make the side teeth cut & work itself back to its normal position

Dec 24 1871



Device for printing on two strips on the Universal Stock Printer, the usual type wheel shaft being provided with an extra ~~[illegible]~~ Type wheel & an independent Printing Lever beneath it, and paper driver. So when you want to stop Printing on the main strip you rotate the Type wheel around to the letter Z where there is a pin ~~[illegible]~~. When the printing lever is brought up this pin strikes a slide bar and shoves it underneath the extra ptg lever and locks the two levers together, so that by working the main ptg lever the other one goes with it & prints characters from the extra wheel but the pad on the extra ptg lever being much higher than on the main lever it does not allow main lever to touch type wheel consequently it does not print. Now when you desire to stop ptg on the extra lever & type W. you turn around to the main dot and strike the ptg lever and a pin from the shaft of the type wheel throws the slide back from underneath the extra ptg lever consequently it ceases to print

I do not wish to confine myself to any particular way of doing this, but claim printing upon two strips of paper by Double Pty Levers & their selection controlled by the position of the type wheel in conjunction with the power derived and the upward or downward motion of either Printing Lever

Dec 24 71

I claim in a Printing Telegraph for type wheel bands of Rubber type, not hard rubber but pliable rubber type in bands and attached over a flat disk,

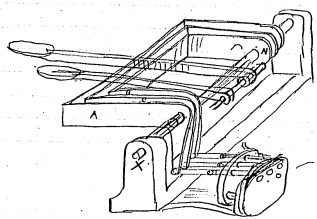
Dec 24 71

I claim fitting a band of ~~st~~ silk or other fabric closely over the Type wheels of a Printing Telegraph & allowing the ink roller to link thereto, instead of the type direct, the object of which is to prevent clogging up the type wheel with fuz from the type wheel

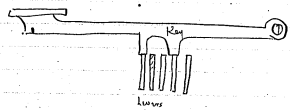
Dec 24 1871

Jos. J. Murray

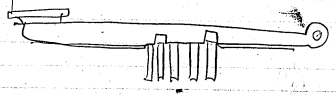
Perforator for Telegraphs



a B C are levers I use nine of them they are worked loose on the shaft X which is its fulcrum These levers are made of 1/8 inch sheet steel and very broad so as to give them the required strength, one is placed inside of the other, & the whole are placed immediately under a bank of keys, In practice I obtain the selection of any ~~key~~ key by making tits or teeth on the key thus

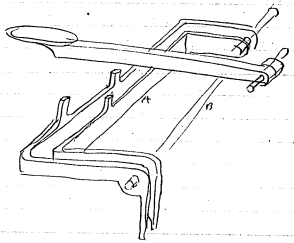


Or these teeth knobs or projections on the keys may be thus

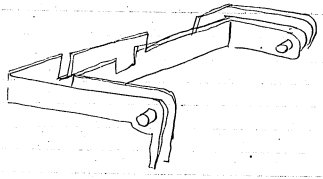


or they may be dispensed with altogether on the Keys and the teeth made on the bars or levers or notches may be Cut in the levers thus

Fig 3

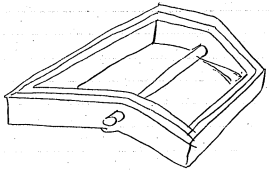


or this way

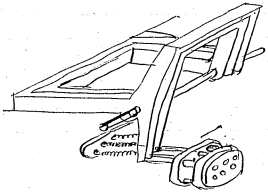


Some trouble may be anticipated by the springing of the levers but this Can be obviated by Connecting a strengthening lever as in Fig 3 from A to B

Or the levers Can be made in this manner



Each square swinging seperately or it Can be made in this form

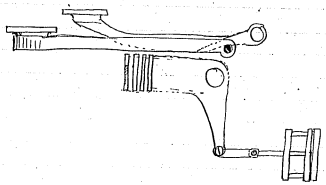


The form of lever is probably better than the ones heretofore discussed owing to the strength of the levers

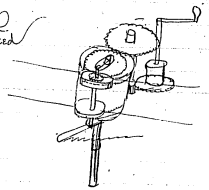
The paper feed device which I intend to use in this machine is peculiar the motive power being derived from a spring or weight, or any outside power not derived from the pressure on the keys.

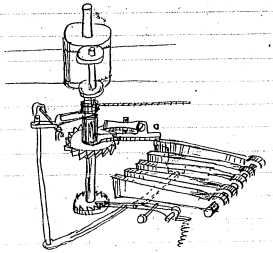
The length of the paper fed is controlled by the levers or by the keys.

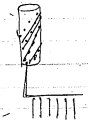
End view



Paper Feed





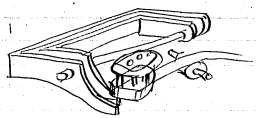


about perforator Jany 13 1872

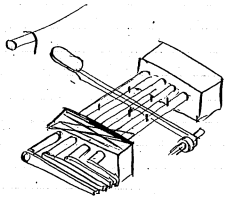
Witnessed Samuel Edison T A Edison Jnr

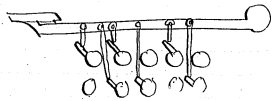
Perforator = I do not wish to confine myself to a die and punches, for I believe they could be dispensed with and cutting punches hollowed out, and cutting on a hard raw hide surface, be substituted with advantage, ~~when~~

Should my paper device prove to be badly arranged in an upright position, the die may be set flat ways instead of edgeways as heretofore shown. Thus (

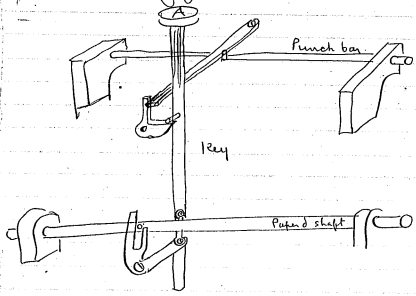


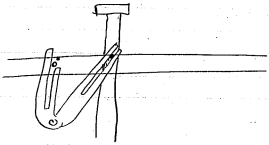
The flat-bars may be deepened with the several round bars substituted. Thus

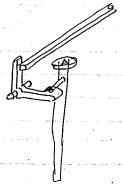




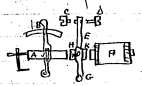
New movement for perforator







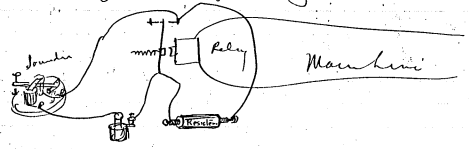
Relay



A is a permanent magnet acts on piece iron H on armature F F is line magnet K its armature Lever E pivoted at G plays between line points C D. B is handle for adjusting permanent magnet closer to its armature,

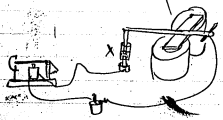
The object of this invention is to dispense with a spring weight gravity etc and adjust with a piece of magnetic steel,

I get around the gauge patent in this way not opening the circuit



When the lever flies back the circuit is only lengthened (10) its resistance increased

Another way



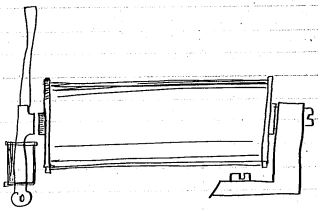
X is a tube, the points being in water when the points are seperated the circuit only passes through the water but is not broken.

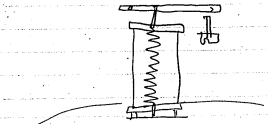
I claim increasing & decreasing the resistance of a local circuit by the action of the relay of another circuit, or mechanically

increasing & decreasing the resistance of any circuit by resistance thrown in or out by a break or Contact points to produce effect at a distance in local or other circuit

Feby 1 1872

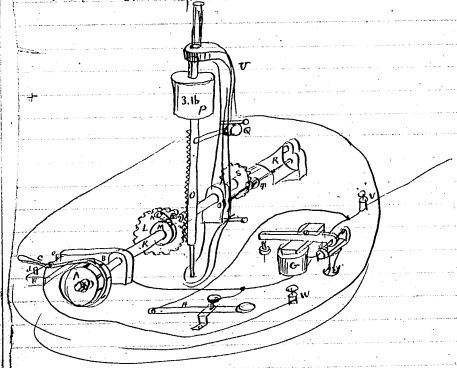
Jos F Murray





The object of this invention is to communicate different signals automatically from a number of machines on one circuit and to record & indicate such signals at a central point. The signalling machines being placed in private houses etc. at a number on one circuit connected to a Central station, and are to be used for instantly summoning the police or a messenger.

The invention consists in a several combinations of Mechanism to effect the object automatically, the Combinations that can be made to perform this operation are so various, unlike, and that to protect myself I shall describe a large number of ways in which the result may be obtained

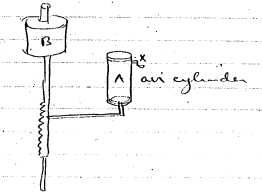


K is a shaft S is a gear wheel T a pinion wheel with a fan R on it. This fan being used to regulate the speed of the shaft K. L is a loose gear wheel carried around by the milled wheel M & click n by the rack O. The rack deriving its power from the weight P. The weight being thrown up by the finger Q is the handle by which this weight is lifted

The handle movement is limited by two limiting pins. It is obvious that if the weight is raised to its full length that the shaft K will remain stationary while it is being raised owing to the position of the click x and when it is allowed to descend it will commence to rotate the shaft K with a certain speed governed by the fan R.

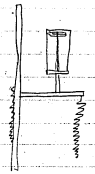
On the end of the shaft K is a double break wheel A with a reversable contact point C secured to the hard rubber stud B the point being limited by the pins d & e. One of these wheels is provided with characters which will open & close the circuit in a manner to indicate "Police" at Central station & also the number of the house the other wheel will indicate "Messenger" after the same manner. When it is desired to call police the contact point is thrown over on one wheel and the weight raised, in descending it rotates the shaft K once thus giving the signal. H is a key connected in the main line G is a test magnet when you are about to give a signal the key is depressed and the main current allowed to circulate through the magnet G which if it remains closed for a small length of time shows that no other signal is being sent when the key is raised the magnet cut out and the weight raised and in descending the signal is transmitted

I do not wish to confine myself to a fan for regulating the speed of the shaft K or the descent of the weight as it can be done by air thus:—

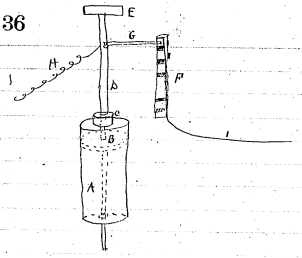


B the weight A. a very tight air cylinder with a piston within it. The piston connecting to the rack & weight when the weight is raised sufficient extra power is applied to force the air out through the small hole X. but when descending the power of the weight can only force it out slowly and consequently it falls slowly.

The weight might be dispensed with and a spring substituted thus.

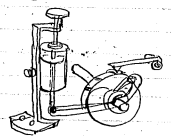


The rack break wheel and its parts might be dispensed with and the same thing accomplished in this way thus:—



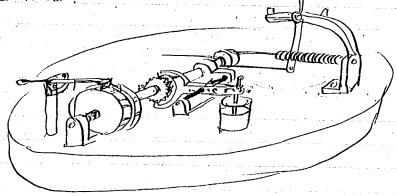
A is a cylinder with a rod D having a head B in this cylinder. E is a knob or handle & serves both the purpose of raising the Rod D and as a weight to force the air out of the cylinder as the piston head descends. G is a Contact spring rubbing on either side of the Signal Bar F. as the case may be, ~~this~~ When it is desired to give the Signal upon the Circuit the Rod D is raised to its full heighth and the Spring G rubbing on either side of the signal Bar or Contact lever F makes & breaks the circuit as the rod slowly descends as it will owing to the force necessary to ~~force~~ expel the air which being greater than the effect of the weight of the rod & the knob E.

The Contact may be made in this manner

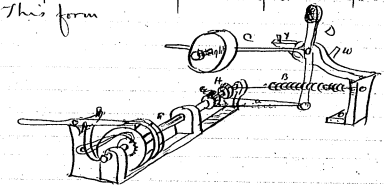


The downward movement of the piston rod moving the Contact wheel a short distance around, four or five Signal being made in one revolutions, and one full signal being upon the segment of the Circle moved.

The air cylinder may be made to regulate the speed of a shaft which may derive its power from any source, The object mainly being to dispense with as many gear wheels as possible or with them entirely, The manner of regulating is thus :—



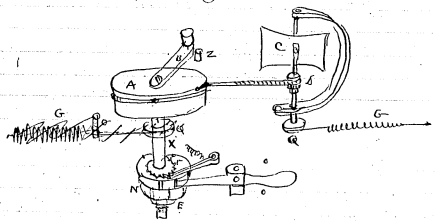
The air cylinder might be dispensed with and a spring attached or a ball might be attached to the End of the Vibrating lever i.e. The form of the teeth which gives motion to this lever can be made in a ratchet ~~form or~~ star, or wavy former The ratchet wheel and Vibrating arm might be dispensed with by making ~~it~~ a governor in this form



F is the shaft ~~H~~ H ~~on two~~ small pulleys a is a cord worked by the lever D, B is a spiral from which the power is derived ~~The spring is provided with a cord where it goes on the pulley H. it being on top and wound in opposite to that on G.~~

C is a weight which is used to regulate the rotation of the shaft F. When in its normal position the Lever D is at the point W, but when a signal is to be given by the rotation of the break wheel The Lever is pulled over by the hand from to Y and this act ~~stores~~ winds up the spring but does no turn the shaft on account of a click which prevent it going backwards, the act of moving this Lever by the hand stores up the power in the weight and when the lever is let free by the hands the shaft commences to turn slowly according to the distance of the weight

There is still another mode of governing the rotation of this shaft, without gears Thus

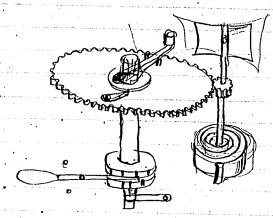


A is a drum upon which is a handle B this is secured to the shaft X. Q is a small pulley on which the cord of the power opq G is secured N are the two break wheels carried around by friction on the shaf X by a spring washer & bolts at E. C is a governing fan connected with the drum A by a Cord

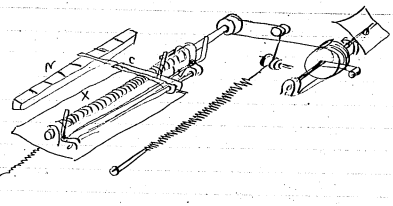
By turning the handle B from 2 to 0. The spring is wound up and when the handle is free ~~to go~~ The shaft commences to turn but cannot go fast as the fan

an large size of the wheel A prevents it.

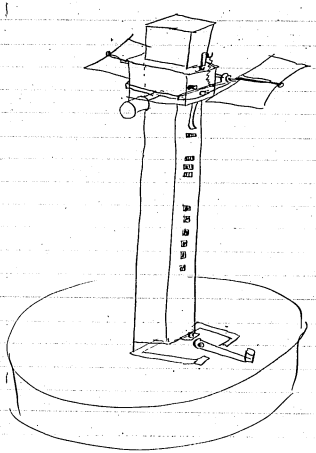
A single gear and flat spring might be used in the following Manner

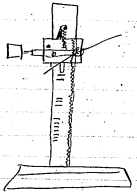


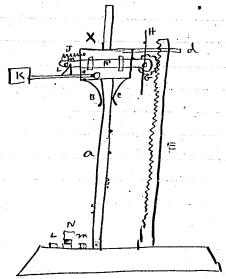
This is another form in which a governor which can is not very necessary. or sights -



X is a screw C a traveller N the break pieces when the drum is wound up the shaft or screw revolves very gradually and the traveller goes over to the other end making the breaks on N. When it gets over it throws a little wire up which throws it out of the thread and is drawn back home on this wire by a equal spring -

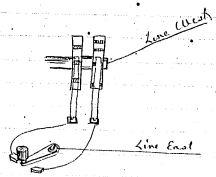




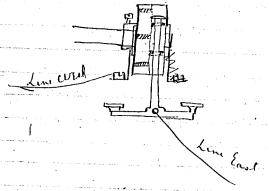


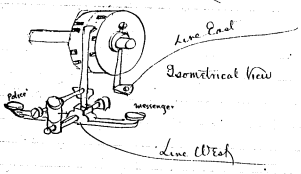
a is a rod of insulating Material with the character sunk in on each side B & C are the contact springs d is a spring which rubs on the side of E and through which the circuit is conducted from E to the Square X. K is a handle pivoted on X ~~and has two limiting~~ and has a Limiting pin to prevent it from falling.

G is a pinion having a fan H screwed to a Slide F, and is thrown out of the rack E when the handle K is lifted in the act of raising X to the top of A from the bottom is thrown back in the rack by the spring f when the handle is released then the block X gradually drops to the bottom with a speed governed by the size of the fans H H. The Contact Spring B or C making a signal by coming in Contact with the side of a The side which shall act being governed by the electric Switch L M N N Bring the bottom connected ~~to X and through~~ with the line and L to one side of a a M to the other



Manner of working the Double break





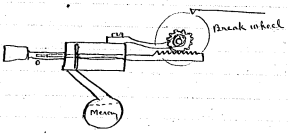
About Signaling Machine

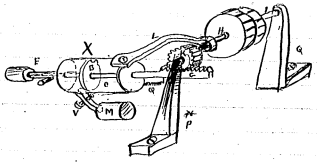
Jany 15 1872

Witnessed Samuel Edison

T A Edison

Here is quite a novel and simple arrangement for performing the ~~arrangemen~~ operation



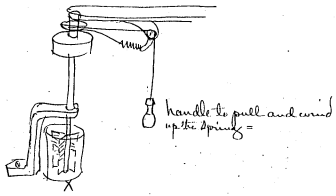


X is a cylinder B a plunger with a rack G on it working in small gear wheel K on main shaft I which has break wheels H same as described before, Q is a spiral to pull the rack back when at rest, the signals where be provided with devices for carrying only one way. L is an arm to which the cylinder X is fastened. The arm swings on the main shaft. M is a small cylinder in which the mercury runs when the cylinder is tipped up as shown, Now if we wish to rotate the signal wheels shaft we take hold of the handle F and let the two cylinders drop by gravity so they stand upright, the moment they do so the mercury from the small cylinder runs ~~into~~ slowly into the large cylinder, (the rapidity with which it runs being governed by a taper screw V) and acting on the head of the rack plunger slowly raises it and rotates the

Shaft & break wheels one revolution

Now by returning the cylinder to the position shown in the Drawing the Mercury runs by ready for the next signal

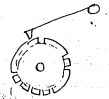
I obtain another slow motion of the shaft carrying the break wheels by putting a fan on it and running this fan in a tube filled with Metallic Mercury.



X is the tube filled with Mercury

I shall now describe the means of indicating the signals & recording the same in the Central office

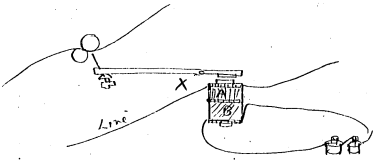
As all of the breaks wheels must necessarily stop on a closed circuit to bring out the signals properly upon an ordinary Morse register a slight alteration is necessary.



The break wheel to give the signal 1 2 5 is made in this manner one break for 1 two breaks for 2 and five breaks for 5 and then the wheel stops on a closed circuit

The signal to be plain should come from the Register in this form

This is done after the following manner



The magnet X of the register has a double set of helices, through one which a local passes constantly and through the other the main. Now when both are closed they neutralize each other, and no mark is made on the paper, but when the break wheel of any machine is started every time an opening occurs the main line current ceases in one of the bobbins for an instant and the local acting brings the lever up and indents a dot, when two breaks follow quickly 2 dots & so on

The dots may be recorded in this manner by polarizing the magnet in such a manner that when the main line current circulates through it it neutralizes the effect of the polarization for the time being but when interrupted for an instant the polarization of the magnet is

sufficient to indent a mark upon the paper
I do not wish to confine myself to an particular
Machine for recording in this Manner
As an Ink recording Machine could be used
or Chemical paper, etc.,

It can also be printed out, I do this in following
Manner,